



DEPARTMENT OF ENERGY

Notice of Availability of Final Waste Incidental to Reprocessing Evaluation for Vitrified Low Activity Waste and Secondary Wastes at the Hanford Site, Washington and Waste Incidental to Reprocessing Determination

AGENCY: U.S. Department of Energy.

ACTION: Notice of availability.

SUMMARY: The U.S. Department of Energy (DOE) announces the availability of the *Final Waste Incidental to Reprocessing Evaluation for Vitrified Low-Activity Waste and Secondary Wastes at the Hanford Site, Washington* (Final WIR Evaluation) and associated *Waste Incidental to Reprocessing Determination for Vitrified Low-Activity Waste and Secondary Wastes at the Hanford Site, Washington* (WIR Determination). The WIR Determination documents DOE's determination that vitrified low-activity waste (VLAW) and secondary wastes generated by, or derived from, such vitrification using the direct feed low-activity waste (DFLAW) approach are wastes that are incidental to the reprocessing of spent nuclear fuel, are not high-level radioactive waste (HLW), and are to be managed as low-level radioactive waste (LLW), pursuant to DOE Order 435.1, *Radioactive Waste Management*, and DOE Manual 435.1-1, *Radioactive Waste Management Manual*. DOE consulted with the Nuclear Regulatory Commission (NRC) and considered comments from States, Tribal Nations, stakeholders and the public before preparing the Final WIR Evaluation and WIR Determination.

ADDRESSES: The Final WIR Evaluation and WIR Determination are available on the Internet at <https://www.hanford.gov/page.cfm/VitrifiedLowActivityWaste> for public review.

FOR FURTHER INFORMATION CONTACT: For further information about the Final WIR Evaluation or the WIR Determination, please contact Mr. Gary L. Pyles by mail at U.S. Department of Energy, Office of River Protection, P.O. Box 450, MSIN H6-60, Richland, Washington 99352, by phone at (509) 376-2670, or by email at gary.pyles@rl.doe.gov.

SUPPLEMENTARY INFORMATION: The Hanford site currently stores radioactive waste in underground storage tanks. The waste was generated, in part, by the prior reprocessing of spent nuclear fuel during the Manhattan Project and Cold War eras, for defense-related nuclear research, development and weapons-production activities. Hanford's current mission focuses on the cleanup and remediation of those wastes and ultimate closure of the site. As part of that mission, DOE is retrieving waste from the Hanford tanks, and has decided to separate the tank waste into a low-activity waste stream and a high-level radioactive waste stream.

The Final WIR Evaluation concerns approximately 23.5 million gallons (Mgal) of separated, pretreated and vitrified low activity waste from some of the underground tanks at the Hanford Site in the State of Washington, and the secondary wastes generated by, or derived from, such vitrification of the separated and pretreated low-activity waste using the DFLAW approach.

The DFLAW approach is a two-phased approach that will separate and pretreat supernate (essentially the upper-most layer of tank waste that contains low concentrations of long-lived radionuclides) from the Hanford tanks, to generate a low-activity waste (LAW) stream. For Phase 1, the DFLAW approach will begin with in-tank settling, separation (removal by decanting) of the supernate (including dissolved saltcake and interstitial liquids), filtration, and then cesium removal using ion-exchange columns in a tank-side cesium removal (TSCR) unit. For Phase 2, DOE will treat additional supernate (including dissolved saltcake and interstitial liquids) using the same processes with either an additional TSCR unit or a filtration and cesium removal facility. The DFLAW approach is expected to remove more than 99 percent of the cesium and remove other key radionuclides. After pretreatment, the LAW stream will be sent by transfer lines to the Low Activity Waste Vitrification Facility at the Hanford Site, where it will be vitrified (immobilized in borosilicate glass). Approximately 13,500 containers of vitrified

waste will be produced using the DFLAW approach. DOE plans to dispose of the VLAW in the onsite Integrated Disposal Facility (IDF), a land disposal facility at the Hanford Site.

The Final WIR Evaluation also addresses secondary wastes generated by, or derived from, the vitrification of the pretreated LAW using the DFLAW approach. DOE's proposed plan is to solidify or encapsulate most of these secondary wastes in a grout matrix at offsite, commercial treatment facilities -- either Perma-Fix Northwest in Richland, Washington, Perma-Fix Diversified Scientific Services in Kingston, Tennessee, or Waste Control Specialists (WCS) near Andrews, Texas, depending on the waste stream. Thereafter, most of the secondary wastes, generated by or derived from vitrification of the LAW using the DFLAW approach, would be disposed of at the IDF at the Hanford Site, and potentially, certain secondary wastes may be disposed at the WCS Federal Waste Facility (WCS FWF) in Texas.

Implementation of the proposed offsite treatment and potential offsite disposal is contingent upon completion of analysis and issuance of a decision document as required by the National Environmental Policy Act of 1969, as amended, 42 U.S.C. 4321, *et seq.* (NEPA). DOE has prepared the *Supplement Analysis of the Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington, Offsite Secondary Waste Treatment and Disposal* (DOE/EIS-0391-SA-03), which evaluated DOE's proposal to transport and treat certain solid and liquid secondary wastes at licensed and permitted commercial treatment facilities off the Hanford Site. The secondary wastes addressed in the Final WIR Evaluation and WIR Determination are a subset of the secondary waste addressed in the above-referenced Supplement Analysis.

The Supplement Analysis also evaluates DOE's proposal to potentially dispose (after treatment) of some of the secondary wastes generated by or derived from vitrification of the LAW using the

DFLAW approach, at an offsite, licensed and permitted commercial disposal facility. The secondary wastes would be mixed LLW, regulated under the Atomic Energy Act of 1954, as amended, and the Resource Conservation and Recovery Act of 1976 (RCRA). The solidification or encapsulation of the secondary wastes would treat the wastes to meet land disposal requirements pursuant to RCRA.

DOE issued DOE Order 435.1 and DOE Manual 435.1-1 under the authority of the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, the Energy Reorganization Act, 42 U.S.C. 5801 *et seq.*, and the Department of Energy Organization Act, 42 U.S.C. 7101, *et seq.* DOE Manual 435.1-1, *Radioactive Waste Management Manual*, which accompanies DOE Order 435.1, *Radioactive Waste Management*, provides for a rigorous evaluation process that DOE uses to determine whether certain waste from the reprocessing of spent nuclear fuel is incidental to reprocessing, is not HLW and may be managed as LLW. This process, set forth in Chapter II.B.(2)(a) of DOE Manual 435.1-1, requires evaluating and demonstrating that the wastes:

- “(1) Have been processed, or will be processed, to remove key radionuclides to the maximum extent that is technically and economically practical; and
- (2) Will be managed to meet safety requirements comparable to the performance objectives set out in 10 CFR part 61, subpart C, *Performance Objectives*; and
- (3) Are to be managed, pursuant to DOE authority under the *Atomic Energy Act of 1954*, as amended, and in accordance with the provisions of Chapter IV of [DOE Manual 435.1-1], provided the waste will be incorporated in a solid physical form at a concentration that does not exceed the applicable concentration limits for Class C LLW as set out in 10 CFR 61.55, *Waste Classification*[.]”

The Final WIR Evaluation, including its appendices and supporting references, documents and demonstrates that the VLAW, and the secondary waste generated by or derived from vitrification

using the DFLAW approach, will meet the above-referenced criteria in DOE Manual 435.1-1.

DOE predicated the Final WIR Evaluation on extensive analysis and scientific rationale, using a risk-informed approach.

Specifically, the Final WIR Evaluation shows that key radionuclides (those radionuclides which contribute most significantly to radiological dose to workers, the public, and the environment as well as radionuclides listed in 10 CFR 61.55) have been or will be removed to the maximum extent technically and economically practical. The Final WIR Evaluation also projects that potential doses to a hypothetical member of the public and hypothetical inadvertent intruder after IDF closure will be well below the doses specified in the performance objectives and performance measures for LLW. In addition, the analyses demonstrate that there is reasonable expectation that safety requirements comparable to the NRC performance objectives at 10 CFR part 61, subpart C will be met. For secondary wastes potentially disposed of at the WCS FWF, the wastes would meet the waste acceptance criteria for the WCS FWF, which would ensure that the performance objectives, including doses, would be met for LLW disposal as set forth in the *Texas Administrative Code*, which are comparable to the NRC performance objectives. In addition, the salient secondary wastes will be incorporated into a solid form at a concentration that does not exceed concentration limits for Class C LLW.

DOE consulted with NRC and received comments from the States, Tribal Nations, stakeholders and the public. After carefully considering NRC consultation advice and comments received, and performing additional analyses, DOE prepared the Final WIR Evaluation. Based on the Final WIR Evaluation, DOE determined, as documented in the associated WIR Determination, that the VLAW and secondary wastes generated by or derived from vitrification using the DFLAW approach, are wastes incidental to reprocessing, are non-HLW, and are to be managed as LLW.

Signing Authority

This document of the Department of Energy was signed on January 25, 2023, by John A. Mullis II, Acting Associate Principal Deputy Assistant Secretary for Regulatory and Policy Affairs, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC on January 26, 2023.

Treena V. Garrett,
Federal Register Liaison Officer,
U.S. Department of Energy.

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